

REMARKS/ARGUMENTS

It is well known in the art that a MEMS array includes a number of MEMS mirrors formed on a substrate and a cover attached to the substrate over the MEMS mirrors. An example of such a MEMS array is shown in FIG. 2 of the application. The supporting text describes the MEMS array as including “a substrate 210, a number of mirrors 220 formed on or from the substrate 210, and a cover 230.” FIG. 2 does not explicitly show the cover attached to the substrate because such attachment is well known and is tangential to the subject matter of the invention.

Among other things, the cover physically protects the MEMS mirrors and allows optical signals to pass to and from the MEMS mirrors. With reference again to FIG. 2, the supporting text indicates that the cover “protects the extremely fragile mirrors 220 and also enables optical signals to pass to and from the mirrors 220.” For example, the cover prevents dust and other objects from touching the MEMS mirrors, and may also form a seal to prevent water, air, or other materials from contaminating the MEMS mirrors. The cover is typically optically clear in order to allow optical signals to pass to and from the MEMS mirrors. As shown in FIG. 2, the cover is typically a flat block made from glass or other material, and provides essentially no optical power.

In accordance with embodiments of the present invention as claimed and described in the specification, a cover for a MEMS array is formed into a lens that adjusts the optical field of at least one movable mirror of the MEMS array. A “covering lens” therefore acts as both a cover and a lens for the MEMS array. The “covering lens” can be clearly distinguished from prior art embodiments, which typically utilize a covered MEMS array and one or more external lenses to adjust the optical field of the MEMS array.

The Examiner rejected claims 1-3, 7-9, and 16 on grounds that the lens arrays 510/520 in FIG. 5 of the present application and the lenses 107/117 (or,

perhaps, lenses 109/117) in the Neilson reference are covering lenses because they are disposed over the mirrors due to their positioning in the incoming/outgoing light paths. It is clear, however, that neither lens arrays 510/520 nor lenses 107/117 are “covering lenses” for purposes of the present invention because they do not act as covers for their respective MEMS arrays and in fact are not even part of the MEMS arrays but are instead external lenses used to direct optical signals to and from the MEMS arrays.

Specifically with regard to the rejection of claims 1, 7, and 16 based on applicant’s admission of the prior art shown in FIG. 5, it is clearly stated in the application that lenses 510/520 are additional lenses that “are placed between the input lens array 110, the first MEMS array 120, the second MEMS array 130, and the output lens array 140.” The MEMS arrays 110/120 implicitly include prior art covers, as shown in FIG. 2, and therefore additional optics are required if adjustment of the optical fields is desired, as shown in FIG. 5. Thus, the lenses 510/520 are not covering lenses. In any case, claims 1 and 7 have been amended to make it clear that the MEMS array includes a substrate with movable mirrors and an attached cover, and that the cover is formed into a covering lens for adjusting the optical field of one or more movable mirrors. Amended claims 1-3 and 7-9 are therefore allowable over applicant’s admission of the prior art shown in FIG. 5.

Similarly, Neilsen shows additional lenses 107/109/113/117/119 that are positioned around the MEMS devices 105/115. The MEMS devices 105/115 would presumably have integral covers, but, regardless, not one of the additional lenses 107/109/113/117/119 could be considered a covering lens for one of the MEMS devices 105/115, particularly as the term “covering lens” is now used in the claims as amended. Amended claims 1-3 and 7-9 are therefore allowable over Neilsen.

The Examiner rejected claims 2, 3, 8, and 9 under 35 U.S.C. 103(a) as being unpatentable over applicant’s admission of the prior art shown in FIG. 9 in view of Neilsen. Because parent claims 1 and 7 are allowable, dependent claims 2, 3, 8,

and 9 are also allowable by default. Regardless, applicant respectfully submits that no admission of prior art has been made with regard to FIG. 9, as FIG. 9 does not represent prior art, but rather represents an exemplary embodiment of the present invention in which the MEMS arrays 920/930 include integral covering lenses.

Withdrawn claims 4-6 are presented with markings in order to indicate changes that would be made should claims 4-6 be reinstated by virtue of an allowable generic claim.

Applicant has decided not to pursue a "means+function" claim at this time, and therefore claim 16 has been canceled. Applicant expressly reserves the right to pursue a "means+function" claim in the future, either by amendment to the present application or by presentation in a continuing application.

All pending claims are believed to be in a form suitable for allowance. Therefore, the application is believed to be in a condition for allowance. The Applicant respectfully requests early allowance of the application. The Applicant requests that the Examiner contact the undersigned, Jeffrey T. Klayman, if it will assist further examination of this application.

Respectfully submitted,



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